$$PM = \frac{337.05 \text{ lbs PM}}{\text{yr}} \left| \frac{1 \text{ ton}}{2000 \text{ lbs}} \right.$$

**PM = 0.169 tons/yr**

$$PM\text{-}10 = \frac{222.5 \text{ ton PM}}{\text{yr}} \left| \frac{1 \text{ ton}}{2000 \text{ lbs}} \right.$$

**PM-10 = 0.111 tons/yr**

*2.2.9.3 VOC Emission Estimates*

The MotivePower facility is considered a synthetic minor source with respect to the VOC emission estimates. The potential VOC emission rate from coating operations after the proposed increase in paint usage is 37.07 tons VOC per year and potential emissions from the General Use Solvent (GUS) are calculated to be 22.66 ton/yr, for a total of 59.73 tons/yr. The currently permitted annual VOC emission estimate is 48.75 ton/yr. VOC emission estimates were established using the following data and assumptions:

- Potential VOC emissions were based on an average of 3.71 lbs/gal of coating and 6.70 lbs/gal of GUS.
- A maximum daily usage rate of 100 gal/day of coating materials at each paint shop was used to estimate hourly emissions.
- A maximum annual usage rate of 26,750 gallons of coating materials was used to estimate annual emissions.
- All VOCs sprayed are emitted through the booth exhaust stacks.
- Approximately 1 gallon of GUS consumed per 2.95 gallon coatings consumed.

Facility-Wide Annual Emissions

| | Proposed Usage | Density (weighted average) | Total Usage | VOC Content (weighted average) | VOC Emissions |
|---|---|---|---|---|---|
| | gal | lbs/gal | lbs | lbs/gal | (lbs) |
| GUS | 6,764.47 | 6.70 | 45,321.92 | 6.70 | 45,321.92 |
| Paint | 19,985.53 | 9.89 | 197,656.94 | 3.71 | 74,146.33 |

VOC = 45,321.92 lbs + 74,146.33 lbs + 119,468.25 lbs

$$VOC = \frac{222.5 \text{ ton PM}}{\text{yr}} \left| \frac{1 \text{ ton}}{2000 \text{ lbs}} \right.$$

**VOC = 59.73 ton/yr**

*2.2.9.4 TAP Emission Estimates*

Worst-case hourly TAP emissions are based on an evaluation of the coating mixtures and cleanup materials used associated with the amount of paint applied at any given shop. Therefore, daily coating logs from the South Large Paint Shop (Booths 1 and 2) and the North Large Paint Shop (Booths 3 and 4) were used to evaluate worst-case hourly TAP emissions, as they are the predominant consumers of paint products at the facility (over 80% of all paint is sprayed in these booths).

The worst-case hourly TAP emissions are best represented by evaluating coating mixtures associated with the largest number of pots applied per day. Therefore, daily coating logs from the month of maximum coating usage at the South Paint Shop (Booth 1 and 2) and the North Paint Shop (Booth 3 and 4) were used to evaluate worst-case hourly TAP emissions.

The maximum average hourly TAP emissions during 07/06-06/07 from the South or North Large Paint Shop was scaled to account for the proposed increase in paint usage (to 26,750 gallons per consecutive 12-month period). Then the potential TAP emissions then compared to the screening emission levels (EL) for non-carcinogens or carcinogens as identified under IDAPA 58.01.01.585 and .586, respectively. TAP emission estimates were established using the following data and assumptions:

- July 2006 – June 2007 coating, thinner, and cleaning material composition, usage and purchasing records for the South and North Large Paint Shops.
- For constituents with a lower and upper concentration range, the upper concentration was used for determining TAP emissions.
- The maximum daily emission rate for either the South Paint Shop (Booth 1 & 2) or the North Paint Shop (Booth 3 & 4).
- July 2006 – June 2007 total coating, thinner, and cleaning material usage of 11,982.1 gallons.
- All volatile TAPs (e.g., ethyl benzene, xylene, etc.) sprayed are emitted uncontrolled through the booth exhaust stacks.

- All non-volatile TAPs (e.g., carbon black, quartz, etc.) emissions are calculated using the Transfer Efficiency of 40% and by the minimum paint booth filter control rate of 99.58%.
- The combined maximum daily emissions from a single paint booth and cleanup solvents are divided by 24 hours to determine the worst-case hourly TAP emissions.

Tables 2.2.9.4.1 and 2.2.9.4.2 summarize the results of this review:

**Table 2.2.9.4.1**
**Worst-Case Hourly TAP Emission Summary**
**MPAS and TEA**

| TAP | CAS No. | South Paint Shop 07/06-06/07 (lbs/gal) | North Paint Shop 07/06-06/07 (lbs/gal) | Max Usage (lbs/gal) | 100 gallon/day (lbs/hr) | EL (lbs/hr) |
|---|---|---|---|---|---|---|
| 1,2,4-Trimethyl benzene | 95-63-6 | 0.0055 | 0.0093 | 0.0093 | 0.0390 | 8.2 |
| **1,6-Hexamethylene Diisocyanate** | **822-06-0** | **0.0009** | **0.0015** | **0.0015** | **0.0062** | **0.002** |
| 1-Methoxy-2-propyl acetate | 108-65-6 | 0.0172 | 0.0208 | 0.0208 | 0.0868 | 24 |
| Acetone | 67-64-1 | 0.0709 | 0.1177 | 0.1177 | 0.4906 | 119 |
| [1] Amorphous silica | 7631-86-9 | 0.0033 | 0.0079 | 0.0079 | 0.0001 | 0.667 |
| Bis(2-ethylhexyl)phthalate (DEHP) | 117-81-7 | 0.0034 | 0.0015 | 0.0034 | 0.0143 | 0.028 |
| Butyl acetate | 123-86-4 | 0.3352 | 0.4388 | 0.4388 | 1.8282 | 47.3 |
| Butyl alcohol | 35296-72-1 | 0.1937 | 0.1571 | 0.1937 | 0.8072 | 10 |
| [1] Carbon black | 1333-86-4 | 0.0135 | 0.0193 | 0.0193 | 0.0002 | 0.23 |
| [1] Cristobalite | 14464-46-1 | 0.0186 | 0.0307 | 0.0307 | 0.0003 | 0.0033 |
| Diisobutyl ketone | 108-83-8 | 0.1006 | 0.0688 | 0.1006 | 0.4192 | 9.67 |
| Dipropylene glycol methyl ether | 34590-94-8 | 0.0000 | 0.0002 | 0.0002 | 0.0007 | 40 |
| Ethyl acetate | 141-78-6 | 0.1784 | 0.2582 | 0.2582 | 1.0760 | 93.3 |
| Ethylbenzene | 100-41-4 | 0.2738 | 0.2637 | 0.2738 | 1.1409 | 29 |
| Ethylene Glycol Monobutyl Ether | 111-76-2 | 0.2098 | 0.1453 | 0.2098 | 0.8741 | 8 |
| Heptane | 142-82-5 | 0.0049 | 0.0054 | 0.0054 | 0.0224 | 109 |
| Isobutyl acetate | 110-19-0 | 0.0431 | 0.0342 | 0.0431 | 0.1794 | 46.7 |
| Isophorone diisocyanate | 4098-71-9 | 0.0005 | 0.0007 | 0.0007 | 0.0031 | 0.006 |
| Isopropyl alcohol | 67-63-0 | 0.0303 | 0.0242 | 0.0303 | 0.1262 | 65.3 |
| [1] Kaolin | 1332-58-7 | 0.2514 | 0.2049 | 0.2514 | 0.0026 | 0.133 |
| [2] Methanol | 67-56-1 | 0.6582 | 0.6582 | 0.6582 | 2.7423 | 17.3 |
| Methyl acetate | 79-20-9 | 0.0630 | 0.0526 | 0.0630 | 0.2625 | 40.7 |

**Table 2.2.9.4.1 (cont.)**
**Worst-Case Hourly TAP Emission Summary**
**MPAS and TEA**

| TAP | CAS No. | South Paint Shop 07/06-06/07 (lbs/gal) | North Paint Shop 07/06-06/07 (lbs/gal) | Max Usage (lbs/gal) | 100 gallon/day (lbs/hr) | EL (lbs/hr) |
|---|---|---|---|---|---|---|
| Methyl amyl ketone | 110-43-0 | 0.4679 | 0.4676 | 0.4679 | 1.9497 | 15.7 |
| Methyl ethyl ketone | 78-93-3 | 0.1516 | 0.1268 | 0.1516 | 0.6315 | 39.3 |
| Methyl isoamyl ketone | 110-12-3 | 0.0166 | 0.0143 | 0.0166 | 0.0691 | 16 |
| Methyl propyl ketone | 107-87-9 | 0.0771 | 0.0753 | 0.0771 | 0.3213 | 46.7 |
| [1] Methylene chloride | 75-09-2 | --- | 0.00005 | 0.0000 | 0.0000 | 0.0016 |
| Mica | 12001-26-2 | 0.0001 | 0.0010 | 0.0010 | 0.0043 | 0.2 |
| Naphthalene | 91-20-3 | 0.0001 | 0.0001 | 0.0001 | 0.0005 | 3.33 |
| Petroleum distillate | 8032-32-4 | 0.2555 | 0.2353 | 0.2555 | 1.0647 | 91.3 |
| Petroleum distillate a (Stoddard Solvent) | 8052-41-3 | 0.1960 | 0.1773 | 0.1960 | 0.8167 | 35 |
| Petroleum distillate b | 8032-32-4 | 0.0070 | 0.0053 | 0.0070 | 0.0290 | 91.3 |
| Propylene glycol monomethyl ether acetate | 108-65-6 | 0.0230 | 0.0323 | 0.0323 | 0.1345 | 24 |
| [1] Quartz-crystalline silica | 14808-60-7 | 0.3633 | 0.3054 | 0.3633 | 0.0038 | 0.0067 |
| Styrene | 100-42-5 | 0.0069 | 0.0063 | 0.0069 | 0.0286 | 6.67 |
| [2] Toluene | 108-88-3 | 1.5689 | 1.5513 | 1.5689 | 6.5371 | 25 |
| Xylene | 1330-20-7 | 1.0341 | 0.9825 | 1.0341 | 4.3086 | 29 |

[1] - Because these are non-volatile TAPs, the EL was calculated by multiplying the hourly rate times the transfer efficiency of 40% and by the minimum PM10 paint booth filter control rate of 99.58%.

[2] - Methanol and Toluene are constituents of the General Use Solvent (GUS), which is used to clean the spray guns and
for touch-up cleaning. As such, GUS use has been proportionally distributed by booth.

Based on the above estimates, only 1,6-Hexamethylene Diisocyanate had predicted emission rates in excess of its EL. In order to determine if dispersion modeling analysis was required, the net increase between the current permit limit and the proposed emission rate was compared to the EL. As such, while the proposed emission rate of 1,6-Hexamethylene Diisocyanate exceeded its EL, the net increase from the currently permitted emission rate is below the EL. Therefore, dispersion modeling analysis was not required. The following table summarizes this TAP modeling determination.

**Table 2.2.9.4.2**
**Screening Emission Level Net Increase Modeling Applicability**
**MPAS and TEA**

| TAP | CAS No. | Requested Emission Rate (lbs/hr) | Current Permit Emission Rate (lbs/hr) | Net Change Requested – Current Limit (lbs/hr) | EL (lbs/hr) |
|---|---|---|---|---|---|
| 1,6-Hexamethylene Diisocyanate | 822-06-0 | 0.0062 | 0.0046 | **0.0016** | 0.002 |

*2.2.9.5 Organic HAP Emission Estimates*

The organic HAP emissions estimates are based upon a maximum annual usage rate of 26,750 gallons of coatings, thinners, and cleaning materials at the nine paint booths. The concentration of organic HAPs within the coating materials was based upon July 2006 through June 2007 usage records for the MotivePower facility. Organic HAP emission estimates were established using the following data and assumptions:

- July 2006 - June 2007 coating, thinner, and cleaning material composition, usage and purchasing records.
- July 2006 - June 2007 total coating, thinner, and cleaning material usage of 11,982.1 gallons.
- A maximum annual usage rate of 26,750 gallons of coatings, thinners, and cleaning materials at the nine paint booths.
- All volatile HAPs (e.g., ethyl benzene, xylene, etc.) sprayed are emitted uncontrolled through the two booth exhaust stacks.

The following table summarizes the results of this review:

**Table 2.2.9.5**
**Maximum Organic HAP Emission Summary**
**MPAS and TEA**

| Individual Hazardous Air Pollutants | CAS No. | 7/06 - 6/07 Actual HAP Emissions lbs | Scaling Factor 26,750/11,982.1 gallons | Potential HAP Emissions lbs/yr | Potential HAP Emissions tons/year |
|---|---|---|---|---|---|
| 1,6-Hexamethylene Diisocyanate | 822-06-0 | 9.66 | 2.232 | 21.56 | 0.011 |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 74.87 | | 167.14 | 0.084 |
| Ethyl benzene | 100-41-4 | 2,328.73 | | 5,198.88 | 2.599 |
| Hexane | 110-54-3 | 0.70 | | 1.56 | 0.001 |
| Methanol | 67-56-1 | 2,640.29 | | 5,894.44 | 2.947 |
| Methylene chloride | 75-09-2 | 0.16 | | 0.35 | 0.000 |
| Naphthalene | 91-20-3 | 0.95 | | 2.12 | 0.001 |
| Styrene | 100-42-5 | 61.49 | | 137.29 | 0.069 |
| Toluene | 108-88-3 | 6,619.06 | | 14,777.03 | 7.389 |
| Xylene | 1330-20-7 | 8,875.32 | | 19,814.13 | 9.907 |

Based upon the above HAP emission estimates, the MotivePower facility will not emit or have the potential to emit 10 ton/yr or more of any HAP, or 25 ton/yr or more of any combination of any HAPs from surface coating operations at the facility if a facility-wide threshold of 26,750-gallons of coatings, thinners, and cleaning materials is maintained. Therefore, MotivePower is not required to comply with 40 CFR Part 63, Subpart MMMM (NESHAP for Surface Coating of Miscellaneous Metal Parts and Products, which became effective January 2007.

### 2.2.10 Dispersion Modeling Input Parameters

The dispersion modeling input parameters and results are summarized in Chapter 4.0, and a copy of the output data is included in Appendix F.

## 2.3 SWBP Blasting, MPAS

The SWBP Building is located near the northern property boundary of the MPAS Facility (See Appendix A, Figure 2). The SWBP Building was issued a PTC on August 17, 1998 and was incorporated into the Tier II OP and PTC issued on November 5, 2002. TAP emissions from the SWBP Building were included in the 2001 calculation of TAP Net Emission Increase because this emission source began operating after July 1, 1995 as specified under IDAPA 58.01.01.007.06.c.i. No TAP evaluation was done during this permitting process because potential emissions from are not increasing as part of this renewal.

As described in Section 2.2.2, the SWBP building is comprised of four separate sections, including a strip section, a wash section, an abrasive shot blasting and primer painting section, and a mechanical and locker/break room section. The strip section is designed for the disassembly of locomotives. The wash section is used to wash the locomotive frame, car body, and miscellaneous equipment. Minor welding takes place in the mechanical room. The blast and paint section is used for steel-grit blasting of locomotive frames and components to remove old paint and rust. The booth is designed so that either painting or blasting can occur at any one time, but never simultaneously. Blasting and primer painting make-up air is provided by a two-speed, 4.5 MMbtu/hr gas-fired heating unit. The dual-use grit-blasting/primer booth has a separate exhaust system for steel grit-blasting and painting.

Emissions from steel grit-blasting are controlled by a Hoffman/Torit, Model HOFT4-64, cartridge dust collector system. Blasting exhaust air is filtered through a 29,300 acfm cartridge dust collector with 64 filter elements, each with 254 $ft^2$ filter area. The system has a minimum PM-10 control efficiency of 99.9 percent, as required in the current Tier II OP and PTC. This is a self-cleaning filter system that uses a pulsating positive air pressure to drop material from the filters into a collection container. The system is designed to operate within a pressure drop of 1-6 inch water column gage (W.G.).

An operations and maintenance manual for the air pollution control equipment used to control PM/PM-10 emissions has been developed, approved by IDEQ, and is maintained on site.

### 2.3.1 Existing Emission Limitations

The requirements that apply to the SWBP Building are summarized in the following table. Specific permit requirements are listed in the existing Tier II OP and PTC.

**Table 2.3.1**
**SWBP Emission Limits**

| Parameter | Permit Limit/Standard | Applicable Requirements |
|---|---|---|
| PM-10 | 0.03 lbs/hr, 0.13 ton/yr | PTC No. 001-00107 |

The existing Tier II OP and PTC contains the following operational, monitoring and recordkeeping requirements for the SWBP grit-blasting booth:

- The maximum amount of steel grit blasting media throughput at the blasting booth shall not exceed 282 ton/day.

- The pressure drop across the Blast Booth Pulse Jet Dust Collector shall be maintained within manufacturer's and O&M Manual specifications and recorded once per day.

- The amount of steel grit in tons per day throughput in the blasting booth at the SWBP building shall be recorded.

2.3.2 Regulatory Applicability

The 2006 Tier II and PTC contains the following operational requirements for the SWBP grit-blasting booth:

- The pressure drop across the Blast Booth Pulse Jet Dust Collector shall be maintained within manufacturer and O&M Manual specifications.

In addition to the Facility-wide requirements summarized in Section 1.11, the requirements that apply to the SWBP Blasting include:

**IDAPA 58.01.01.700.02** - Notwithstanding the provisions of Sections 701..., no source shall be required to meet an emission limit of less than one pound per hour.

**IDAPA 58.01.01.701.01** - No person shall emit into the atmosphere from any process or process equipment commencing operation on or after October 1, 1979, particulate matter in excess of the amount shown by the following equations, where E is the allowable emission from the entire source in pounds per hour, and PW is the process weight in pounds per hour:

Specifically, if PW is equal to or greater than 9,250 pounds per hour, $E = 1.10(PW)^{0.25}$.

**IDAPA 58.01.01.161** - Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.

Process weight limitations of IDAPA 58.01.01.700 through 701 are applicable to shot blasting operations. Requirements of Section 701 are applicable to the TEA Shot Blast Booth because the shot blast booth commenced operation after October 1, 1979. This regulation limits the particulate emissions as a function of the mass of media used per hour, as per the equation $E = 1.10(PW)^{0.25}$, where E is the allowable emission rate in lbs/hr and PW is the process weight rate (mass of media) in lbs/hr. The maximum allowable particulate emission rate from blasting operations in the booths is calculated below using the above equation. The SWBP blasting is physically limited to 23,250 lbs steel-grit per hour.

$$E = \frac{1.10}{} \left| \frac{(23{,}520 \text{ lb shot})^{0.25}}{\text{hr}} \right. = \frac{13.6 \text{ lb PM}}{\text{hr}}$$

The maximum particulate emission rate from blasting operations in the booth, as shown in Section 2.3.3, is 0.148 lbs PM/hr. This emission rate is less than the 1.0 lbs/hr minimum rate limit; therefore, process weight limitations are inherently met by using the minimum emission rate limit.

2.3.3 Emission Estimates

*2.3.3.1 Steel Grit-Blasting Emissions*

Particulate emissions from steel grit-blasting were estimated in 2001 using emission factors from AP-42, Section 13.2.6, Abrasive Blasting (Supplement D, 1997). The total particulate emissions for sand blasting are given as a function of the mass of abrasive used and the wind speed. The average emission factors for painted surfaces (worst case) were used to estimate PM, PM-10, Cadmium, Chromium$^{3+}$, Manganese, Nickel, and Lead. AP-42 also indicates that particulate emission factors for blasting using steel shot are about 10 percent of the emission factors for that of sand.

Hourly Emissions:

Total PM: $\frac{23{,}520 \text{ lbs shot}}{\text{hr}} \left| \frac{6.3 \text{ lb PM}}{1000 \text{ lb shot}} \right| (1\text{-}0.999) = \frac{0.148 \text{ lbs}}{\text{hr}}$

PM-10: $\frac{23{,}520 \text{ lbs shot}}{\text{hr}} \left| \frac{2.20 \text{ lb PM-10}}{1000 \text{ lb shot}} \right| (1\text{-}0.999) = \frac{0.052 \text{ lbs}}{\text{hr}}$

Cadmium: $\frac{23{,}520 \text{ lbs shot}}{\text{hr}} \left| \frac{2.8 \text{ E-4 lb}}{1000 \text{ lb shot}} \right| (1\text{-}0.999) = \frac{6.59 \text{ E-6 lbs}}{\text{hr}}$

Chromium$^{3+}$: $\frac{23{,}520 \text{ lbs shot}}{\text{hr}} \left| \frac{1.1 \text{ E-3 lb}}{1000 \text{ lb shot}} \right| (1\text{-}0.999) = \frac{2.59 \text{ E-5 lbs}}{\text{hr}}$

Manganese: $\frac{23{,}520 \text{ lbs shot}}{\text{hr}} \left| \frac{3.3 \text{ E-4 lb}}{1000 \text{ lb shot}} \right| (1\text{-}0.999) = \frac{7.76 \text{ E-6 lbs}}{\text{hr}}$

Nickel: $\frac{23{,}520 \text{ lbs shot}}{\text{hr}} \left| \frac{1.1 \text{ E-3 lb}}{1000 \text{ lb shot}} \right| (1\text{-}0.999) = \frac{2.59 \text{ E-5 lbs}}{\text{hr}}$

| | | | | | | |
|---|---|---|---|---|---|---|
| Lead: | 23,520 lbs shot / hr | 1.4 E-3 lb / 1000 lb shot | (1-0.999) | = | 3.29 E-5 lbs / hr | |

Annual Emissions: Annual emissions were obtained by multiplying the daily emission rate by 365 day/yr.

| | | | | | | |
|---|---|---|---|---|---|---|
| Total PM: | 0.148 lb / hr | 8760 hr / yr | ton / 2,000 lb | = | 0.65 ton / yr | |
| PM-10: | 0.052 lb / hr | 8760 hr / yr | ton / 2,000 lb | = | 0.23 ton / yr | |
| Cadmium: | 6.59 E-6 lb / hr | 8760 hr / yr | ton / 2,000 lb | = | 2.89 E-5 ton / yr | |
| Chromium$^{3+}$ | 2.59 E-5 lb / hr | 8760 hr / yr | ton / 2,000 lb | = | 1.13 E-4 ton / yr | |
| Manganese: | 7.76 E-6 lb / hr | 8760 hr / yr | ton / 2,000 lb | = | 3.40 E-5 ton / yr | |
| Nickel: | 2.59 E-5 lb / hr | 8760 hr / yr | ton / 2,000 lb | = | 1.13 E-4 ton / yr | |
| Lead: | 3.29 E-5 lb / hr | 8760 hr / yr | ton / 2,000 lb | = | 1.44 E-4 ton / Yr | |

*2.3.3.2 SWBP Heater Emissions*

Although the heaters in the North Large Paint Shop were determined to be exempt from PTC requirements during the 2006 Tier II OP and PTC modification, emissions were included in the dispersion modeling analysis. Emissions were calculated using emission factors for AP-42, Section 1.4, *Natural Gas Combustion*, July 1998 for small boilers (<100 MMbtu/hr). A conversion factor of 1020 Btu/scf was used to calculate natural gas usage on the basis of the boiler capacity. Annual emissions were calculated on the basis of 8,760 hrs/yr of operation. The heater is rated at 4.536 MMBtu/hr (4,447.06 scf/hr).

**Table 2.3.3.2**
**SWBP Heater Emission Estimates**

| Pollutant | Emission Factor | Heat Rating | Emission Rate | Emissions |
|---|---|---|---|---|
| | lbs/scf | scf/hr | lbs/hr | tons/yr |
| PM / PM-10 | 0.0000076 | 4,447.06 | 0.0338 | 0.148 |
| SO2 | 0.0000006 | | 0.0027 | 0.012 |
| NOx | 0.0001 | | 0.445 | 1.948 |
| VOCs | 0.0000055 | | 0.0245 | 0.107 |
| CO | 0.000084 | | 0.3736 | 1.636 |

2.3.4 Dispersion Modeling Input Parameters

Emissions from the natural gas heater may be vented from either the paint booth exhaust vent or the vent for the blast booth, depending on what source is operating. Worst-case dispersion characteristics are associated with the blast booth vent because the stack is closer to the facility property boundary and is closer to ground level (2 m vs. 10 m). Therefore, emissions from the natural gas heater were modeled exclusively from the blast booth exhaust vent. Although grit blasting cannot occur simultaneously with painting, both emissions were modeled together as a conservative approach to simplify the modeling exercise.

The dispersion modeling input parameters and results are summarized in Chapter 4.0, and a copy of the output data is included in Appendix F.

## 2.4 Compressor Test Stand Engine, TEA

The air compressor test stand, which is located at the north of the main building at the TEA (south of the Proceco Parts Washer) is powered by a 1965 4-cylinder 98 horsepower Cummins, diesel-fired internal combustion engine. The diesel engine that powers the compressor test stand has a maximum fuel consumption of 5.7 gallons of diesel fuel per hour under a load of 1800 rpm. Emissions from the compressor test stand engine are uncontrolled. The operation of the diesel engine is limited to powering the compressor test stand engine. Please note, the existing Tier II OP and PTC Condition 12.1 incorrectly describes the unit as a 130 horsepower engine that consumes 3.0 gallons per hour of diesel. In addition, the compressor test stand engine stack has been relocated to the north end of the main building at the TEA, directly south of the Proceco Parts Washer unit.

2.4.1 Existing Emission Limitations

The requirements that apply to the Compressor Test Stand Engine are summarized in the following table. Specific permit requirements are listed in the 2006 Tier II OP and PTC.

**Table 2.4.1**
**Compressor Test Stand Emission Limits**

| Parameter | Permit Limit/Standard | Applicable Requirements |
|---|---|---|
| PM-10 | 0.127 lbs/hr, 0.56 ton/yr | IDAPA 58.01.01.403 |
| NO2 | 1.81 lbs/hr, 7.9 ton/yr | IDAPA 58.01.01.403 |
| $SO_2$ | 0.119 lbs/hr, 0.52 ton/yr | IDAPA 58.01.01.403 |
| CO | 0.39 lbs/hr, 1.71 ton/yr | IDAPA 58.01.01.403 |
| VOC | 0.25 lbs/hr, 0.54 ton/yr | IDAPA 58.01.01.403 |
| Visible emissions | 20% opacity for no more than three minutes in any 60-minute period. | IDAPA 58.01.01.625 |

The 2006 Tier II OP and PTC contains the following operating, monitoring and recordkeeping requirements:

- Maximum throughput of 72 gallons per day and 26,280 gallons per consecutive 12-month period of diesel fuel.
- Operation of the diesel engine is limited to powering the compressor test stand.
- Throughput of fuel in gal/day and gal/yr (any 12 month-rolling period) using monthly records.
- The fuel oil sulfur content certification provided by the supplier for each shipment.

2.4.2 Regulatory Applicability

**IDAPA 58.01.01.222.c.i** (Category II Exemption) - No permit to construct is required for a source that satisfies the criteria set forth in Section 220 and is a stationary internal combustion engine of less than or equal to 600 horsepower and which is fueled by … diesel fuel.

No limits on the hours of operation are required for engines of 100 horsepower or less, to qualify for this exemption. Therefore, no restrictions are required for the Compressor Test Stand. However, to demonstrate compliance with the NAAQS, MotivePower is requesting a permit condition that limits operation of the Compressor Test Stand Engine to 1,000 hours per consecutive 12-month period, and between 5:00 am and 9:00 pm. MotivePower suggests that a permit condition be included that requires TEA staff to keep a log of hours of operation to ensure compliance with this proposed operational limit.

2.4.3 Emission Estimates

Emission factors for the compressor test stand engine were obtained from: EPA AP 42, 3.3 Gasoline and Diesel Industrial Engines & 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines October 1996. The following are the emission factors used:

- NOx: 0.031 lb/hp-hr
- CO: 0.00668 lb/hp-hr
- PM and PM-10: 0.0022 lb/hp-hr
- VOCs: 0.002514 lb/hp-hr
- SO2: 0.00205 lb/hp-hr

Fuel Use

| | |
|---|---|
| Hourly Fuel Use: | Up to 5.7 gal/hr of diesel will be combusted during compression testing. |
| Annual Fuel Use: | Assume 1,000 hours per at 5.7 gal/hr. This will result in the consumption of 5,700 gallons per consecutive 12-month period of diesel fuel. |
| Sulfur Content: | The sulfur content of the diesel fuel is 0.5% or less. |

**Table 2.4.3**
**Compressor Test Stand Engine Emission Estimates**

| Pollutant | Emission Factor | Power | Emission Rate | Emissions |
|---|---|---|---|---|
| | lbs/hp-hr | hp | lbs/hr | ton/yr |
| PM/PM-10 | 0.0022 | 98 | 0.216 | 0.1078 |
| Sulfur Dioxide - SO2 | 0.00205 | | 0.201 | 0.1005 |
| Nitrogen Oxides - NOx | 0.031 | | 3.038 | 1.5190 |
| VOCs | 0.002514 | | 0.246 | 0.1232 |
| Carbon Monoxide - CO | 0.00668 | | 0.655 | 0.3272 |

2.4.4 Dispersion Modeling Input Parameters

The dispersion modeling input parameters and results are summarized in Chapter 4.0, and a copy of the output data is included in Appendix F.

## 2.5 Locomotive Engine Test Cell Stand, TEA

The Locomotive Engine Test Cell is located outside the east end of the main TEA building (See Appendix A, Figure 3). Remanufactured locomotive engines are tested in a sound deadening room with the combustion exhaust vented through a muffler system and then to the atmosphere through a 21 ft stack. A maximum of 1,600 hours of locomotive engine testing is conducted at the TEA per 12-month period. Engines are either tested over a four-hour or an eight-hour period. Therefore, up to 400 engines can be tested annually.

The engines consume up to 175 gal/hr of diesel fuel. The facility was constructed or modified in 1990. There are no emission control devices on the locomotive engine test cell stand. An operations and maintenance manual for the engine test cell has been developed to comply with visible emission limits during startup and is maintained on site.

The maximum daily throughput of the locomotive engine test cell will not exceed 1,750 gal/day of diesel fuel or exceed 10 hours of testing per day. The maximum annual throughput of the locomotive engine test cell will not exceed 280,000 gallons of diesel fuel per any consecutive 12-month period. Currently, the Tier II OP and PTC limits the testing of engines to 200 per year. However, MotivePower is requesting that this permit condition be removed on the grounds that it is unnecessary to ensure compliance with the emission limits outlined in the permit. Since operational limits exist for annual and daily hours of operation and fuel consumption, the additional limit on the number of allowable tests is duplicative and restricts operational

flexibility while not providing any additional assurances that emissions from the locomotive test cell stand remain below major source thresholds. The combination of fuel consumption and hours of operation limits provides the level of control contemplated by the Tier II OP and PTC.

In order to demonstrate compliance with the NAAQS, MotivePower is requesting a permit condition that limits operation of the Locomotive Engine Test Cell to between 5:00 am and 1:00 am. MotivePower suggests that a permit condition be included that requires TEA staff to keep a log of hours of operation to ensure compliance with this proposed operational limit.

2.5.1 Existing Permit Conditions

The requirements that apply to the TEA Engine Test Cell are summarized in the following table. Specific permit requirements are listed in the 2006 Tier II OP and PTC.

**Table 2.5.1**
**Locomotive Engine Test Cell Permit Conditions**

| Parameter | Permit Limit/Standard |
|---|---|
| PM-10 | 3.55 lbs/hr; 2.84 ton/yr |
| NOx | 101.09 lbs/hr; 80.87 ton/yr |
| $SO_2$ | 9.98 lbs/hr; 7.98 ton/yr |
| CO | 14.7 lbs/hr; 11.76 ton/yr |
| VOC | 8.10 lbs/hr; 6.48 ton/yr |
| Visible emissions | 20% opacity for no more than three minutes in any 60-minute period. |

The Tier II OP and PTC contains the following operating, monitoring and recordkeeping requirements:

- Maximum daily throughput of 1,750 gal/day and 280,000 gal/yr of diesel fuel per any consecutive 12-month period.
- Maximum number of locomotive engines tested is 200 per any consecutive 12-month period. (MotivePower is requesting this condition be eliminated)
- Maximum daily hours of operation are 10 hr/day.
- Record visible emissions observations and conditions on a weekly basis.

- Record the throughput of fuel in gal/day and gal/yr (any consecutive 12-month period).

- Record the number of hours of operation in hr/day and hr/yr (any consecutive 12-month period).

- Record the number of locomotive engines produced per month and per any consecutive 12-month period.

- Record the fuel oil sulfur content certification provided by the supplier for each shipment.

The records will be retained onsite for the most recent five-year period and will be made available to IDEQ representatives upon request.

2.5.2 Applicable Requirements

Facility-wide applicable requirements are summarized in Section 1.11. TAP emissions from this source were not included in the 2001 calculations of TAP Net Emission Increase since the emission source was operating prior to July 1, 1995, as per IDAPA 58.01.01.007.06.

**40 CFR 63, Subpart PPPPP**, Engine Test Cells/Stands

Engine test cells/stands were identified as major sources of HAP such as toluene, benzene, mixed xylenes, and 1,3-butadiene. An engine test cell/stand is any apparatus used for testing uninstalled stationary or uninstalled mobile (motive) engines. This rule was effective May 27, 2003. Each new or reconstructed affected source used for testing internal combustion engines with a rated power of 25 horsepower or more that is located at a major source of HAP emissions must comply with the requirements.

Existing affected sources (i.e., constructed on or before 5/14/02), which are located at major sources of HAP emissions, are not required to comply with the requirements of Subpart PPPPP and of Subpart A of Part 63. Therefore, Subpart PPPPP would not apply to MotivePower unless a new engine test cell/stand was installed or the existing engine test cells/stands were reconstructed at the facility.

2.5.3 Emission Estimates

Locomotive engine testing emission factors were obtained from: Technical Highlights, Emission Factors for Locomotives, EPA Office of Mobile Sources. Document EPA 420-F-97-051,

December 1997, Table 9, for 2008 Fleet Average Emission Factors For All Locomotives, in accordance with discussion with IDEQ permitting staff. This document can be found in Appendix G.

- NOx: 172.5 g NOx/gal
- CO: 27.4 g CO/gal
- PM and PM-10: 6.0 g PM/gal
- VOCs: 9.6 g VOCs/gal

Emission factors were not available from the above source for SO2. Older locomotive emission factors from AP-42 were used for SO2. The SO2 factor is:

- SO2: 57 lbs SO2/1000 gal

Fuel Use

Hourly Fuel Use: Up to 175 gal/hr of diesel will be combusted during engine testing.

Daily Fuel Use: Up to 10 hours per day.

Annual Fuel Use: 1,600 hours of operation at 175 gallon per hour for 280,000 gallons of diesel fuel per consecutive 12-month period.

Hourly, Daily and Annual Emission Estimates

Hourly Emissions:

PM and PM-10: $\frac{175 \text{ gal diesel}}{\text{hr}} \mid \frac{6.0 \text{ g PM-10}}{\text{gal diesel}} \mid \frac{\text{lbs}}{453.59 \text{ g}} = \frac{2.31 \text{ lbs}}{\text{hr}}$

NOx: $\frac{175 \text{ gal diesel}}{\text{hr}} \mid \frac{172.5 \text{ g NO2}}{\text{gal diesel}} \mid \frac{\text{lbs}}{453.59 \text{ g}} = \frac{66.55 \text{ lbs}}{\text{hr}}$

CO: $\frac{175 \text{ gal diesel}}{\text{hr}} \mid \frac{27.4 \text{ g CO}}{\text{gal diesel}} \mid \frac{\text{lbs}}{453.59 \text{ g}} = \frac{10.57 \text{ lbs}}{\text{hr}}$

SO2:

$$\frac{175\ \text{gal diesel}}{\text{hr}} \times \frac{57\ \text{lb SO2}}{1000\ \text{gal diesel}} \times \frac{\text{lbs}}{} = \frac{9.98\ \text{lbs}}{\text{hr}}$$

VOCs:

$$\frac{175\ \text{gal diesel}}{\text{hr}} \times \frac{9.6\ \text{g VOCs}}{\text{gal diesel}} \times \frac{\text{lbs}}{453.59\ \text{g}} = \frac{3.70\ \text{lbs}}{\text{hr}}$$

Annual Emissions:

PM and PM-10:

$$\frac{280{,}000\ \text{gal diesel}}{\text{yr}} \times \frac{6.0\ \text{gm PM-10}}{\text{gal}} \times \frac{\text{lbs}}{453.59\ \text{gm}} \times \frac{\text{ton}}{2000\ \text{lb}} = \frac{1.85\ \text{ton PM-10}}{\text{yr}}$$

NOx:

$$\frac{280{,}000\ \text{gal diesel}}{\text{yr}} \times \frac{172.5\ \text{gm NO2}}{\text{gal}} \times \frac{\text{lbs}}{453.59\ \text{gm}} \times \frac{\text{ton}}{2000\ \text{lb}} = \frac{53.24\ \text{ton NOx}}{\text{yr}}$$

CO:

$$\frac{280{,}000\ \text{gal diesel}}{\text{yr}} \times \frac{27.4\ \text{gm CO}}{\text{gal}} \times \frac{\text{lbs}}{453.59\ \text{gm}} \times \frac{\text{ton}}{2000\ \text{lb}} = \frac{8.46\ \text{ton CO}}{\text{yr}}$$

SO2:

$$\frac{280{,}000\ \text{gal diesel}}{\text{yr}} \times \frac{57\ \text{lbs SO2}}{1000\ \text{gal}} \times \frac{\text{ton}}{2000\ \text{lb}} = \frac{7.98\ \text{ton SO2}}{\text{yr}}$$

VOC:

$$\frac{280{,}000\ \text{gal diesel}}{\text{yr}} \times \frac{9.6\ \text{gm PM-10}}{\text{gal}} \times \frac{\text{lbs}}{453.59\ \text{gm}} \times \frac{\text{ton}}{2000\ \text{lb}} = \frac{2.96\ \text{ton VOCs}}{\text{yr}}$$

### 2.5.4 Dispersion Modeling Input Parameters

Emissions were conservatively estimated by assuming that the engines are tested continually at the highest fuel consumption rate (Notch 8); stack parameters corresponding to this scenario were used for the dispersion modeling analysis. The dispersion modeling input parameters and results are summarized in Chapter 4.0, and a copy of the output data is included in Appendix F.

## 2.6 Shot-Blast Booth, TEA

The TEA Shot Blast Booth, a Hoffman Schmidt/Abrasive Steel Shot Blaster was constructed in 1994. The booth is located in the northwestern section of the main TEA building. Up to 48,000 lbs/hr of steel shot may be applied through the blast nozzles. Emissions from shot-blasting are controlled by a Torit Model HDFT2-16 Downflow Cartridge Dust Collector. Blasting exhaust air is filtered through the dust collector at 8,500 acfm at ambient temperatures and is exhausted through one stack. The system has a minimum PM-10 control efficiency of 99 percent.

An operations and maintenance manual for the air pollution control equipment used to control PM/PM-10 emissions has been developed, approved by IDEQ, and is maintained on site.

2.6.1 Existing Emission Limitations

The requirements that apply to the TEA Shop Blast Booth are summarized in the following table. Specific permit requirements are listed in the Tier II OP and PTC.

**Table 2.6.1**
**TEA Shot-Blast Booth Emission Limits**

| Parameter | Permit Limit/Standard |
|---|---|
| $PM_{10}$ | 0.624 lbs/hr, 1.37 ton/yr |

The Tier II OP and PTC contains the following operating, monitoring and recordkeeping requirements:

- Maximum amount of blast media is 48,000 lbs/hr.
- Maximum hours of operation are 12 hours per day and 4,380 hours per 12-month period.
- Record the amount of blast media throughput in pounds per day and the daily number of hours in hours per day and hours per 12-month period.
- Record the pressure drop across the baghouse system on a daily basis when operating.

MotivePower, in order to demonstrate compliance with relevant NAAQS, is requesting an enforceable permit condition restricting operation of the TEA Shot-Blast Booth to between 5:00 am and 1:00 am. MotivePower recommends that a permit condition be included in the PTC requiring that a log documenting hours of operation be maintained to ensure compliance with the proposed restriction.

2.6.2 Regulatory Analysis

In addition to the facility-wide requirements summarized in Section 1.11, the requirements that apply to the Shot-Blast Booth at the TEA include:

**IDAPA 58.01.01.700.02** - Notwithstanding the provisions of Sections 701…"no source shall be required to meet an emission limit of less than one pound per hour."

**IDAPA 58.01.01.701.01** - No person shall emit into the atmosphere from any process or process equipment commencing operation on or after October 1, 1979, particulate matter in excess of the amount shown by the following equations, where E is the allowable emission from the entire source in pounds per hour, and PW is the process weight in pounds per hour:

Specifically, if PW is equal to or greater than 9,250 pounds per hour, $E = 1.10(PW)^{0.25}$

**IDAPA 58.01.01.161** - Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.

Process weight limitations of IDAPA 58.01.01.700 through 701 are applicable to shot blasting operations. Requirements of Section 701 are applicable to the TEA Shot Blast Booth because the shot blast booth commenced operation after October 1, 1979. This regulation limits the particulate emissions as a function of the mass of media used per hour, as per the equation $E = 1.10(PW)^{0.25}$, where E is the allowable emission rate in lbs/hr and PW is the process weight rate (mass of media) in lbs/hr. The maximum allowable particulate emission rate from blasting operations in the booths, as calculated using the above equation

$$E = \frac{1.10 \mid (48{,}000 \text{ lbs shot})^{0.25}}{\text{hr}} = \frac{16.3 \text{ lbs PM}}{\text{hr}}$$

This emission rate is greater than the estimated emission rate calculated in Section 2.6.3 (3.02 lbs/hr); therefore, process weight limitations are inherently met through the proposed emission limit.

2.6.3 Emission Estimates

TAP emissions from this source were not included in the 2006 calculation of TAP Net Emission Increase since the emission source was operating prior to July 1, 1995, as per IDAPA 58.01.01.007.06. The emission estimates that were provided in the 2006 Tier II and PTC have not changed and are summarized for reference.

Particulate emissions from shot blasting were estimated in 2006 using emission factors from AP-42, Section 13.2.6, Abrasive Blasting (Supplement D, 1997). The total particulate emissions for sand blasting are given as a function of the mass of abrasive used and the wind speed. The average emission factors for painted surfaces (worst case) were used to estimate PM, PM-10, and

Lead. AP-42 also indicates that particulate emission factors for blasting using steel shot are about 10 percent of the emission factors for that of sand.

To allow for reasonable operational flexibility, it was estimated that the source would operate up to 12 hr/day for 365 day/yr, which equates to 4,380 hours per 12-month period.

Hourly Emissions:

PM: $\frac{48{,}000 \text{ lbs shot}}{\text{hr}} \mid \frac{6.3 \text{ lbs PM}}{1000 \text{ lbs shot}} \mid \frac{99\%}{\text{C.E.}} = \frac{3.02 \text{ lbs}}{\text{hr}}$

PM-10: $\frac{48{,}000 \text{ lbs shot}}{\text{hr}} \mid \frac{2.2 \text{ lbs PM-10}}{1000 \text{ lbs shot}} \mid \frac{99\%}{\text{C.E.}} = \frac{1.06 \text{ lbs}}{\text{hr}}$

Lead: $\frac{48{,}000 \text{ lbs shot}}{\text{hr}} \mid \frac{1.4 \text{ E-3 lbs lead}}{1000 \text{ lbs shot}} \mid \frac{99\%}{\text{C.E.}} = \frac{6.72 \text{ E-4 lbs}}{\text{hr}}$

Annual Emissions:

PM: $\frac{3.02 \text{ lbs}}{\text{hr}} \mid \frac{12 \text{ hr}}{\text{day}} \mid \frac{365 \text{ day}}{\text{yr}} = \frac{6.62 \text{ tons}}{\text{yr}}$

PM-10: $\frac{1.06 \text{ lbs}}{\text{hr}} \mid \frac{12 \text{ hr}}{\text{day}} \mid \frac{365 \text{ day}}{\text{yr}} = \frac{2.31 \text{ tons}}{\text{yr}}$

Lead: $\frac{6.72 \text{ E-4 lbs}}{\text{hr}} \mid \frac{12 \text{ hr}}{\text{day}} \mid \frac{365 \text{ day}}{\text{yr}} = \frac{1.47 \text{ E-3 tons}}{\text{yr}}$

2.6.4 Dispersion Modeling Input Parameters

The dispersion modeling input parameters and results are summarized in Chapter 4.0, and a copy of the data is included in Appendix F.

## 2.7 Bead-Blast Enclosures, MPAS and TEA

Two bead-blast enclosures are located at the MPAS facility, and two bead-blast enclosures are located at the TEA. The four bead blast enclosures use fine-grained, rounded glass beads (Potter Quality Ballotini Impact Beads, Type VI, Class 2). All of the units utilize 1/8-inch diameter nozzles, and have a potential media usage rate of 115 lbs/hr.

An operations and maintenance manual for the air pollution control equipment used to control PM/PM-10 emissions has been developed, approved by IDEQ, and is maintained on site.

The bead-blast enclosures at the MPAS facility are located in the Component Shop and the Locomotive Shop (See Appendix A, Figure 2). The Fabrication Shop Bead Blast Enclosure is no longer in service. Air from the dust filtration system stack is exhausted inside the each building.

Component Shop Bead Blast Enclosure

This unit is a Cycloblast Model 4836-F with a bag filter collection efficiency of 98 percent. The exhaust flow rate is approximately 775 acfm at ambient temperature (293 K). Air from the dust filtration system stack is exhausted inside the building. The unit was installed in 1984.

Locomotive Shop Bead Blast Enclosure

This unit is a Cycloblast Model 4836-DC100 with a bag filter collection efficiency of 98 percent. The exhaust flow rate is approximately 775 acfm at ambient temperature (293 K). Air from the dust filtration system stack is exhausted inside the each building. The unit was installed in 1984.

TEA Bead Blast Enclosure, Unit 1

Unit 1 is a Cycloblast Model 4836-DC100 with a bag filter collection efficiency of 98 percent. The exhaust flow rate is approximately 775 acfm at ambient temperature. The unit was installed in 1990.

TEA Bead Blast Enclosure, Unit 2

Unit 2 is a Pangorn-S3 with a bag filter collection efficiency of 98 percent. The exhaust flow rate is approximately 1,500 acfm at ambient temperature. The unit was installed in 1996.

### 2.7.1 Existing Emission Limitations

The requirements that apply to the Bead Blast Enclosures are summarized in the following table. Specific permit requirements are listed in the 2006 Tier II OP and PTC.

**Table 2.7.1**
**Bead Blast Enclosures Emission Limits**

| Parameter | Permit Limit/Standard |
|---|---|
| PM-10 | 0.025 lbs/hr, 0.11 ton/yr |

The Tier II OP contains the following operating, monitoring and recordkeeping requirements:

- Maximum amount of blast media is 960 lbs/hr each.
- Record the amount of blast media throughput in pounds per day and the daily hours of hours for each unit.

2.7.2 Applicable Requirements

IDAPA 58.01.01.317.01.b.i (30) - An emission unit or activity with potential emissions less than or equal to the significant emission rate as defined in Section 006 and actual emissions less than or equal to ten percent of the levels contained in Section 006 of the definition of significant and no more than one ton/yr of any hazardous air pollutant.

The bead blast enclosures are considered exempt because uncontrolled emissions are less than 10 percent of Significant Emission Rates of IDAPA 58.01.01.006.90. Specifically, 10 percent of the significant emission rates for PM and PM-10 are 2.5 ton/yr and 1.5 ton/yr. Therefore, MotivePower is requesting that the new PTCs do not contain any permit conditions containing operational limitations or recordkeeping requirements.

2.7.3 Emission Estimates

AP-42 emission factors for Abrasive Blasting (Section 13.2.6, 1997) were used for bead blasting. In Section 13.2.6 (Table 4-2) of AP-42, enclosed blasting of unspecified parts with glass beads was sampled at the fabric filter stack and resulted in a time weighted average concentration of 2.3 $mg/m^3$. However, due to the low concentration, an emission factor was not provided. The emission factor that most closely resembles enclosed blasting with glass beads was enclosed blasting with garnet, which was sampled at the fabric filter stack and resulted in a time weighted average concentration of 126 $mg/m^3$. The emission factor for enclosed blasting with garnet was given as 0.69 lb Total PM/1000 lb of abrasive blasted. Emissions are controlled by baghouses with a control efficiency of 98% prior to exhausting within the buildings. The PM control efficiency for emissions inside a building is 70% (source: Fugitive Dust Control Technology, 1983).

Hourly Emissions:

$$\frac{0.69 \text{ lbs PM/PM10}}{1{,}000 \text{ lbs abrasive}} \left| \frac{115 \text{ lbs abrasive}}{\text{hr}} \right| \frac{(1\text{-}0.98)}{\text{Baghouse control}} = \frac{0.016 \text{ lbs PM/PM10}}{\text{hr}}$$

Annual Emissions:

$$\left| \frac{0.016 \text{ lbs}}{\text{hr}} \right| \frac{8{,}760 \text{ hr}}{\text{yr}} \left| \frac{\text{ton}}{2{,}000 \text{ lbs}} \right| = \frac{0.007 \text{ ton}}{\text{yr}}$$

Furthermore, particulate emissions from the MPAS bead-blasting units are emitted inside building and are considered fugitive emissions. Additionally, the baghouse that exists in this unit will largely reduce the particulate emissions before they are vented into the building. Fugitive particulate emissions from these sources will be reasonably controlled in accordance with IDAPA 58.01.01.650-651.

Because the PTE for total PM is less than both 10 percent of the significant emission rates for PM and PM-10 and because actual emissions would be expected to be much less due to the additional control provided by the buildings, the bead blast enclosures are considered insignificant.

As such, MotivePower is requesting that the permit conditions for the four bead-blast enclosures be removed during the PTC replacement of the Tier II OP and PTC. In addition, these sources are considered insignificant as outlined in IDAPA 58.01.01.317.01.b.i.30.

2.7.4 Dispersion Modeling Input Parameters

Because the bead blast enclosures are considered insignificant, no air dispersion modeling appears to be warranted at this time. In addition, no air dispersion model was required in 2001 or 2006, and emissions from the bead-blast enclosures have not increased.

## 2.8 Nutshell Blasting Unit, MPAS

The nutshell blasting unit is used primarily to clean and polish the air brake components. The blasting unit uses Trinco nutshells as the abrasive media and is located outside the air brake room of the Component Shop building. Particulate matter emissions from the unit are controlled by a dust filtration system that has a control efficiency of 98%. Air from the dust filtration system stack is exhausted inside the Component Shop building.

The actual operation of the unit is approximately ½ hour every other day. The unit was installed in 1997. The manufacturer specifications include: Universal ½ horse power (hp); 3450 revolution per minute (rpm); Nozzle size: 3/8 inch at 80 pounds per square inch (psi) Media: Trinco abrasive nutshell Maximum media throughput: 63 lbs/hr.

The exhaust stack is 5 feet in height and 4 inches in diameter with an exit flow of 775 scfm and exit temperature of 70 $^{o}$ F.

Emissions from the nutshell-blasting unit are particulate matter. Particulate matter emissions from this unit will be vented to a baghouse that has control efficiency of 98%. Emissions will then be vented inside a building. It is assumed that all PM emissions are equal to PM-10. These emissions are considered fugitive.

According to the Material Safety Data Sheet, no HAPs or TAPs will be emitted during the nutshell blasting.

2.8.1 Existing Emission Limitations

Because the PTE for total PM is less than both 10 percent of the significant emission rates for PM and PM-10 and because actual emissions would be expected to be much less, the nutshell blasting unit was considered insignificant by the IDEQ in previous permitting exercises.

2.8.2 Applicable Requirements

IDAPA 58.01.01.317.01.b.i (30) - An emission unit or activity with potential emissions less than or equal to the significant emission rate as defined in Section 006 and actual emissions less than or equal to ten percent of the levels contained in Section 006 of the definition of significant and no more than one ton/yr of any hazardous air pollutant.

The nutshell-blasting unit is considered exempt because uncontrolled emissions are less than 10 percent of Significant Emission Rates of IDAPA 58.01.01.006.90. Specifically, 10 percent of the significant emission rates for PM and PM-10 are 2.5 ton/yr and 1.5 ton/yr.

2.8.3 Emission Estimates

The following are the uncontrolled and controlled PM emissions estimates from the nutshell blasting unit:

Given data:

- Throughput: 63 lbs/hr.
- Emission factor: 0.01 pounds PM/pound media used (controlled emission factor as previously submitted by MotivePower).
- Baghouse control efficiency: 98%
- PM control efficiency (for emissions inside a building): 70% (source: Fugitive Dust Control Technology, 1983).
- Hours of operations: 0.5 hours per day (hr/d), 3 days per week (d/wk).

PM-10 Uncontrolled Emissions:

- Hourly Emissions: (63 lbs/hr)(0.01 lbs PM/lb media)(1/1-0.98) = 31.5 lbs/hr
- Yearly Emissions: (31.5 lbs/hr)(1 T/2,000 lbs)(8,760 hr/yr) = 138 ton/yr.

PM-10 Controlled Emissions:

- Hourly Emissions: (31.5 lbs/hr) (0.02 )(0.3) = 0.189 lbs/hr
- Yearly Emissions: (0.189 lbs/hr)(0.5 hr/d)(3 d/wk)(52 wks/yr)(1 T/ 2,000 lbs) = 0.0074 ton/yr

Particulate emissions from the nutshell-blasting unit are emitted inside building and are considered fugitive emissions. Additionally, the baghouse that exists in this unit will largely reduce the particulate emissions before they are vented into the building. Fugitive particulate emissions from this source will be reasonably controlled in accordance with IDAPA 58.01.01.650-651.

2.8.4 Dispersion Modeling Input Parameters

Because the nutshell-blasting unit is considered insignificant, no air dispersion modeling appears to be warranted at this time.

## 2.9 Miscellaneous Solvent Usage

Solvents are used at the MotivePower facility for a variety of purposes, including the cleaning of mechanical parts, equipment cleaning, and cleanup after painting operations. Historically, most of the solvent used to clean mechanical parts and equipment was conducted in Safety Kleen Solvent Stations. However, these stations were replaced with Ace Solvent Systems and Zepp Part Cleaning Units. The Ace units continuously distill the petroleum-based parts cleaning solvent (i.e., Stoddard Solvent) using a low temperature vacuum distillation process. The

individual units are sealed to minimize solvent evaporation. 14 parts cleaning units are present at the MPAS facility, and 5 units are present at the TEA.

Emissions associated with solvent usage as part of surface coating operations are included with the specific units (e.g., paint booths) where they are used.

### 2.9.1 Existing Emission Limitations

No existing emission limitations exist for the parts cleaning units.

### 2.9.2 Applicable Requirements

**IDAPA 58.01.01.223.01** - The parts cleaning units qualify for a Below Regulatory Concern (BRC) exemption as described below.

### 2.9.3 Emission Estimates

Historically, each parts cleaning unit utilizes approximately 1.3 gallons per month (8.71 lbs/month or 0.012 lbs/hr) of Stoddard solvent.

Usage rates would not be expected to vary much on a monthly basis. However, even considering a two-fold increase in production at the MotivePower facility, the parts cleaning units qualify for a BRC exemption as specified under IDAPA 58.01.01.223.01.

The units qualify for the BRC exemption because the uncontrolled emission rate for TAPs emitted by each unit is less than 10% of the applicable screening emission level for Stoddard Solvent that would be equivalent to 3.5 lbs/hr.

### 2.9.4 Dispersion Modeling Input Parameters

Because the parts cleaning units are considered BRC, no air dispersion modeling appears to be warranted at this time.

## 3.0 EMISSIONS SUMMARY

The following tables provide a summary of potential emissions from emission sources at the MotivePower facility.

**Table 3.1**
**Facility-Wide Ton Per Year Emission Estimates**

| Totals in Tons per Year | PM | PM-10 | $NO_2$ | CO | $SO_2$ | VOC | HAP | Lead |
|---|---|---|---|---|---|---|---|---|
| ***Painting Operations at MPAS and TEA*** | | | | | | | | |
| *All Paint Booths* | | | | | | | | |
| *- South Large Paint Shop (Booth 1 & 2)* | | | | | | | | |
| *- North Large Paint Shop (Booth 3 & 4)* | | | | | | | | |
| *- SWBP Building (Booth 5)* | 0.17 | 0.11 | | | | 59.73 | 23.73 | |
| *- Small Paint Shop (Booth 6)* | | | | | | | | |
| *- Spray Paint Booth, TEA Annex (Booth 7)* | | | | | | | | |
| *- East Paint Shop (Booth 8 & 9)* | | | | | | | | |
| ***Other Emission Sources*** | | | | | | | | |
| *Seller Boiler No. 1 or No. 2* | 0.22 | 0.22 | 2.88 | 2.42 | 0.02 | 0.16 | | 1.44E-05 |
| *SWBP Shot Blasting* | 0.65 | 0.23 | | | | | | 1.44E-04 |
| *TEA Shot Blasting* | 6.62 | 2.31 | | | | | | 1.47E-03 |
| *MPAS Bead Blasting* | 0.01 | 0.01 | | | | | | |
| *TEA Bead Blasting* | 0.01 | 0.01 | | | | | | |
| *Locomotive Engine Test Cell Stand* | 1.85 | 1.85 | 53.24 | 8.46 | 7.98 | 2.96 | | |
| *Compressor Test Stand Engine* | 0.11 | 0.11 | 1.52 | 0.33 | 0.10 | 0.12 | | |
| *All Natural Gas Emissions* | 0.47 | 0.47 | 6.24 | 5.24 | 0.04 | 0.34 | | |
| *Generator Diesel Fuel Emissions* | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | | |
| *Fire Pump Diesel Fuel Emissions* | 0.08 | 0.08 | 1.11 | 0.24 | 0.07 | 0.09 | | |
| *LPG Heater Emissions* | 0.00 | 0.00 | 0.11 | 0.02 | 0.00 | 0.00 | | |
| **Total Emissions (tons per year)** | **10.20** | **5.42** | **65.10** | **16.70** | **8.21** | **63.42** | **23.73** | **1.63E-03** |

## 3.2 TAP Emission Summary

A TAP analysis was conducted as part of the 2006 Tier II and PTC application for proposed increases to emission rates from the painting operations. Similarly, a TAP analysis was conducted as part of this application. This TAP analysis is specific to the modifications associated with the type and quantities of coatings, thinners, and cleaning materials for surface coating operations at the nine paint booths at the MotivePower facility. No increases in emission rate were proposed for other units at the MotivePower facility. Therefore, a TAP analysis was not warranted for those existing sources.

As detailed in Section 2.2.8.4, MotivePower has completed a review of the TAP constituents present within each coating, thinner, and cleanup material used between July 2006 through June 2007 at the facility to facilitate the calculation of surface coating related emissions. The raw data can be found in Appendix C, and a summary of the TAP analysis is provided in Table 3.2:

**Table 3.2**
**Worst-Case Hourly TAP Emission Summary**
**MPAS Facility and TEA**

| TAP | CAS No. | 100 gallon/day lbs/hr | EL lbs/hr | Modeling Required |
|---|---|---|---|---|
| 1,2,4-Trimethyl benzene | 95-63-6 | 0.0390 | 8.2 | No |
| **1,6-Hexamethylene Diisocyanate** | **822-06-0** | **0.0062** | **0.002** | **No** |
| 1-Methoxy-2-propyl acetate | 108-65-6 | 0.0868 | 24 | No |
| Acetone | 67-64-1 | 0.4906 | 119 | No |
| [1] Amorphous silica | 7631-86-9 | 0.0001 | 0.667 | No |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 0.0143 | 0.028 | No |
| Butyl acetate | 123-86-4 | 1.8282 | 47.3 | No |
| Butyl alcohol | 35296-72-1 | 0.8072 | 10 | No |
| [1] Carbon black | 1333-86-4 | 0.0002 | 0.23 | No |
| [1] Cristobalite | 14464-46-1 | 0.0003 | 0.0033 | No |
| Diisobutyl ketone | 108-83-8 | 0.4192 | 9.67 | No |
| Dipropylene glycol methyl ether | 34590-94-8 | 0.0007 | 40 | No |
| Ethyl acetate | 141-78-6 | 1.0760 | 93.3 | No |
| Ethylbenzene | 100-41-4 | 1.1409 | 29 | No |
| Ethylene Glycol Monobutyl Ether | 111-76-2 | 0.8741 | 8 | No |
| Heptane | 142-82-5 | 0.0224 | 109 | No |
| Isobutyl acetate | 110-19-0 | 0.1794 | 46.7 | No |

**Table 3.2 (cont.)**
**Worst-Case Hourly TAP Emission Summary**
**MPAS Facility and TEA**

| TAP | CAS No. | 100 gallon/day lbs/hr | EL lbs/hr | Modeling Required |
|---|---|---|---|---|
| Isophorone diisocyanate | 4098-71-9 | 0.0031 | 0.006 | No |
| Isopropyl alcohol | 67-63-0 | 0.1262 | 65.3 | No |
| [1] Kaolin | 1332-58-7 | 0.0026 | 0.133 | No |
| [2] Methanol | 67-56-1 | 2.7423 | 17.3 | No |
| Methyl acetate | 79-20-9 | 0.2625 | 40.7 | No |
| Methyl amyl ketone | 110-43-0 | 1.9497 | 15.7 | No |
| Methyl ethyl ketone | 78-93-3 | 0.6315 | 39.3 | No |
| Methyl isoamyl ketone | 110-12-3 | 0.0691 | 16 | No |
| Methyl propyl ketone | 107-87-9 | 0.3213 | 46.7 | No |
| [1] Methylene chloride | 75-09-2 | 0.0000 | 0.0016 | No |
| Mica | 12001-26-2 | 0.0043 | 0.2 | No |
| Naphthalene | 91-20-3 | 0.0005 | 3.33 | No |
| Petroleum distillate | 8032-32-4 | 1.0647 | 91.3 | No |
| Petroleum distillate a (Stoddard Solvent) | 8052-41-3 | 0.8167 | 35 | No |
| Petroleum distillate b | 8032-32-4 | 0.0290 | 91.3 | No |
| Propylene glycol monomethyl ether acetate | 108-65-6 | 0.1345 | 24 | No |
| [1] Quartz-crystalline silica | 14808-60-7 | 0.0038 | 0.0067 | No |
| Styrene | 100-42-5 | 0.0286 | 6.67 | No |
| [2] Toluene | 108-88-3 | 6.5371 | 25 | No |
| Xylene | 1330-20-7 | 4.3086 | 29 | No |

1-Because these are non-volatile TAPs, the EL was calculated by multiplying the hourly rate times the transfer efficiency of 40% and by the minimum PM10 paint booth filter control rate of 99.58%.

2-Methanol and Toluene are constituents of the General Use Solvent (GUS), which is used to clean the spray guns and for touch-up cleaning. As such, GUS use has been proportionally distributed by booth.

Based upon a comparison of the source's emission rates for each TAP to the applicable screening emission levels listed in IDAPA 58.01.01.585 or 586, no further analysis was required to determine if air dispersion modeling was needed to determine TAP compliance. This analysis can be found in Chapter 2.2.9.4.2.

## 3.3 HAP Emission Summary

The HAP emissions estimates are based upon a maximum annual usage rate of 26,750 gallons of coatings, thinners, and cleaning materials at the nine paint booths. The concentration of organic HAPs within the coating materials was based upon July 2006 through June 2007 usage records for the MotivePower facility as detailed in Section 2.2.8.4.

**Table 3.3**
**HAP Emission Summary**
**Surface Coating Operations**

| Hazardous Air Pollutant | tons/yr |
|---|---|
| 1,6-Hexamethylene Diisocyanate | 0.0110 |
| Bis(2-ethylhexyl)phthalate (DEHP) | 0.0840 |
| Ethyl benzene | 2.5990 |
| Hexane | 0.0010 |
| Methanol | 2.9470 |
| Methylene chloride Dichloromethane) | 0.0000 |
| Naphthalene | 0.0010 |
| Styrene | 0.0690 |
| Toluene | 7.3890 |
| Xylene | 9.9070 |
| Cadmium | 2.90E-05 |
| $Chromium^{3+}$ | 1.10E-04 |
| Manganese | 3.40E-05 |
| Nickel | 1.10E-04 |
| Lead | 1.60E-03 |
| *Total HAP Emissions (tons per year)* | **23.01** |

Based upon the above HAP emission estimates, the MotivePower facility will not emit or have the potential to emit 10 tons per your or more of any single HAP, or 25 tons per year or more of any combination of any HAPs from surface coating operations at the facility. Therefore, MotivePower is not required to comply with 40 CFR Part 63, Subpart MMMM (NESHAPs) for Surface Coating of Miscellaneous Metal Parts and Products, which become effective on January 2, 2007.

## 3.4 Summary of Modifications and Proposed Operational Conditions

A summary of modifications that will occur as a result of this PTC application is as follows for each emission source at the MotivePower facility:

3.4.1 Seller Boilers No. 1 and No. 2, MPAS

No modifications are proposed for this source.

3.4.2 Surface Coating Operations, MPAS and TEA

MotivePower is requesting the replacement of the existing daily and annual coating and thinner usage rates for each individual paint booth with new daily (100 gallon per day per paint shop) and facility-wide annual (26,750 gallons) paint products usage rate. The following table provides a summary of the proposed emission limitations and operational conditions:

**Table 3.4.2**
**Proposed Emission Limits and Operational Conditions**
**MPAS Facility and TEA**

| Emission Source | PM-10 Emissions | | HAP Emissions | VOC Emissions | Maximum Quantity Paint Products Applied |
|---|---|---|---|---|---|
| | lbs/hr | tons/yr | tons/yr | tons/yr | gal/yr |
| South Large Paint Shop (Paint Booths 1 & 2) | 0.035 | 0.11 | 9.907[a]<br>23.73[b] | 59.73 | 26,750 |
| North Large Paint Shop (Paint Booths 3 & 4) | 0.035 | | | | |
| SWBP Building (Paint Booth 5) | 0.017 | | | | |
| Small Paint Shop (Paint Booth 6) | 0.035 | | | | |
| TEA Spray-Paint Booth (Paint Booth 7) | 0.035 | | | | |
| East Paint Shop (Paint Booths 8 & 9) | 0.035 | | | | |

[a] – Any Single HAP
[b] – Combined HAPs

As demonstrated above, the use of facility-wide emission limitations for PM-10, VOCs and HAPs that are emitted by the nine paint booths located at the MotivePower facility, as well as, the use of facility-wide coating application rates to ensure compliance with the emission limitations will provide more operational flexibility and set federally enforceable emission limits, which will permit the use of a more reasonable PTE.

For all paint booths, MotivePower will continue to maintain the static pressure drop across each spray-paint-booth exhaust filter and changes the filter pads in accordance with manufacturer specifications. MotivePower will record the pressure drop across each spray-paint-booth filter system once daily (excluding days when not operating). MotivePower will also maintain and operate a pressure-drop monitoring device.

With respect to surface coating operations, MotivePower will continue to conduct the following monitoring and recordkeeping tasks:

- Maintain a current copy of information provided by materials suppliers or manufacturers, such as manufacturer's formulation data, or test data used to determine the quantity of VOCs, organic HAP, and density for each coating, thinner and/or other additive, and cleaning material.
- Maintain a record of the calculation of the total quantity of VOCs and organic HAP emissions for the coatings, thinners and/or other additives, and cleaning materials used each month and the calculation of each 12-month VOC and organic HAP emission rate.
- Maintain a record of the name and volume of each coating, thinner and/or other additive, and cleaning material used during each monthly period.
- Maintain a record of the weight of VOCs and organic HAPs for each coating, thinner and/or other additive, and cleaning material used during each monthly period.
- Maintain a record of the density for each coating, thinner and/or other additive, and cleaning material used during each monthly period.
- If using an allowance for VOCs or organic HAP contained in waste materials sent to or designated for shipment to a treatment, storage, and disposal facility (TSDF), MotivePower will keep records of the information, including:
  - The name and address of each TSDF to which waste materials were sent for which we used an allowance and the date of each shipment.
  - Identification of the coating operations producing waste materials included in each shipment and the month or months in which we used the allowance for these materials.
  - The methodology used to determine the total amount of waste materials sent to or the amount collected, stored, and designated for transport to a TSDF each month; and the methodology to determine the weight of VOCs and organic HAP contained in these waste materials. This may include the sources for all data used in the determination, methods used to generate the data, frequency of testing or monitoring, and supporting calculations and documentation, including the waste manifest for each shipment.

3.4.3 Shot-Blast Booth, MPAS

No modifications are proposed for this source.

3.4.4 Compressor Test Stand Engine, TEA

Please correct the description of the unit to show the correct size and capacity of 98 horsepower and 5.7 gallons per hour. In addition, in order to exempt this source from the dispersion modeling analysis, MotivePower is requesting that a permit condition be added to the PTC that limits operation of this source to 1,000 hours per year, and that operation is limited to between 5:00 am and 9:00 pm. This is to ensure compliance with the NAAQS. MotivePower recommends that a permit condition be included in the PTC requiring that a log documenting hours of operation be maintained to ensure compliance with the proposed restriction.

3.4.5 Locomotive Engine Test Cell Stand, TEA

To allow for variability in the type and durations of engine testing at the Locomotive Engine Test Cell Stand at the TEA, MotivePower is proposing to modify the operational limitations so that they are only based upon a maximum of 1,600 hours of testing, 1,750 gallons per day, and 280,000 gallons of fuel per year. Limiting the number of engine tests has no impact on reducing or controlling potential emission rates because emissions are based strictly on fuel combustion and hours of operation. In addition, to ensure compliance with the NAAQS, MotivePower is requesting that operations of the Locomotive Engine Test Cell Stand be limited daily to between 5:00 am and 1:00 am. MotivePower recommends that a permit condition be included in the PTC requiring that a log documenting hours of operation be maintained to ensure compliance with the proposed restriction. No other modifications are proposed.

3.4.6 Shot-Blast Booth, TEA

MotivePower is requesting that operations of the Shot-blast booth be limited daily between 5:00 am through 1:00 am. This limit is requested to ensure compliance with the NAAQS. MotivePower recommends that a permit condition be included in the PTC requiring that a log documenting hours of operation be maintained to ensure compliance with the proposed restriction. Also, to reflect the updated emission calculations for PM and PM-10 provided in Section 2.6.3, MotivePower is proposing the following modification:

**Table 3.4.6**
**Proposed Emission Limits**
**TEA Shot-Blast Booth**

| Parameter | Proposed Emission Limit |
|---|---|
| PM-10 | 1.06 lbs/hr, 2.32 ton/yr |

### 3.4.7 Bead-Blast Enclosures and Nutshell Blasting Unit, MPAS and TEA

MotivePower is requesting that the Bead-Blast Enclosures (two at MPAS and two at the Annex) be designated as insignificant emission sources on the basis of their sizes as detailed in Section 2.8.3 and 2.9.3. IDEQ has previously stated that these units must remain in the Tier II OP and PTC because PTCs were originally issued for these sources. However, since this permitting exercise is intended to replace all previous permits, these units can correctly be identified as insignificant and therefore removed from PTC requirements.

The bead-blast enclosures, as designed, meet the requirements under IDAPA 58.01.01.317.b.i.(30) and should be classified as insignificant activities. Therefore, we are requesting the designation of these emission sources as insignificant to minimize our recordkeeping and reporting obligations associated with these units and the classification of these insignificant activities in the new PTC, once issued.

### 3.4.8 Miscellaneous Solvent Usage

No modification is proposed for this source.